IN THE CLAIMS

Please amend the claims as follows:

1. (Currently Amended) A low phase-noise oscillator comprising:

a frequency generator to generate a reference signal at an oscillation frequency responsive to a control signal;

a delay element comprising a high-temperature superconductor to time-delay the reference signal and provide a low phase-noise time-delayed reference signal; [[and]]

a variable phase shifter to generate a phase-shifted reference signal; and

a phase detector to generate the control signal from a phase difference between the low phase-noise time-delayed reference signal and the a phase-shifted reference signal, [[.]]

wherein during operation, the control signal is to cause the frequency generator to change the oscillation frequency to drive the phase difference between the low phase-noise time-delayed reference signal and the phase-shifted reference signal to substantially ninety degrees.

2. (Original) The oscillator of claim 1 wherein the high-temperature superconductor is disposed on a semiconductor substrate to provide the low phase-noise time-delayed reference signal when cooled to within a cryogenic-temperature range.

3. (Original) The oscillator of claim 2 wherein the delay element comprises a coplanar waveguide comprising the high-temperature superconductor, the coplanar waveguide to operate as a delay line to provide the low phase-noise time-delayed reference signal when cooled to within the cryogenic temperature range.

4. (Original) The oscillator of claim 3 wherein the coplanar waveguide is arranged on the semiconductor substrate in a substantially random pattern.

5. (Original) The oscillator of claim 1 further comprising a cooling element to reduce the temperature of the delay element.

6. (Original) The oscillator of claim 5 wherein the cooling element reduces the temperature of the delay element to within a cryogenic temperature range.

7. (Original) The oscillator of claim 2 wherein the high-temperature superconductor comprises Yttrium-Barium-Copper Oxide, and wherein the substrate comprises either Lanthanum-Aluminum Oxide or Magnesium Oxide.

8. (Original) The oscillator of claim 7 wherein the delay element time-delays the reference signal and provides the low phase-noise time-delayed reference signal when cooled to a cryogenic temperature ranging between 30 and 120 degrees Kelvin.

9. (Currently Amended) The oscillator of claim [[1]] 11 wherein the frequency generator is a voltage controlled oscillator (VCO), and the control signal is a control voltage generated by the phase detector.

10. (Original) The oscillator of claim 9 wherein the frequency generator is surface acoustic wave (SAW) VCO.

11. (Currently Amended) The oscillator of claim [[10]] 1 ~~further comprising a~~ wherein the variable phase shifter is to phase shift the reference signal to generate the phase-shifted reference signal; [[,]] and

wherein the oscillator further comprises a signal splitter to split the reference signal from the frequency generator and provide the reference signal to both the phase shifter and delay element,

wherein the phase shift provided by the variable phase shifter is selectable to set the oscillation frequency. ~~the phase shifter is a variable phase shifter to generate the phase-shifted reference signal having approximately ninety-degree phase difference from the time-delayed reference signal.~~

12. (Currently Amended) A low phase-noise oscillator comprising:

a frequency generator to generate a reference signal at an oscillation frequency responsive to a control signal;

a delay element comprising a high-temperature superconductor to time-delay the reference signal and provide a low phase-noise time-delayed reference signal;

a phase detector to generate the control signal from a phase difference between the low phase-noise time-delayed reference signal and a phase-shifted reference signal;

a phase shifter to phase shift the reference signal to generate the phase-shifted reference signal;

~~The oscillator of claim 11 further comprising:~~

a signal splitter to split the reference signal from the frequency generator and provide the reference signal to both the phase shifter and delay element; and

a low-pass filter to filter the control signal and provide a filtered control signal to the frequency generator, [[.]]

wherein the frequency generator is a voltage controlled oscillator (VCO) comprising a surface acoustic wave (SAW) VCO,

wherein the control signal is a control voltage generated by the phase detector, and

wherein the phase shifter is a variable phase shifter to generate the phase-shifted reference signal having approximately ninety-degree phase difference from the time-delayed reference signal.

13. (Original) The oscillator of claim 12 wherein:

the delay element comprises a coplanar waveguide comprising the high-temperature superconductor, the coplanar waveguide to operate as a delay line to provide the low phase-noise time-delayed reference signal when cooled to a cryogenic temperature;

the coplanar waveguide has a length between 100 and 1000 meters to provide the time delay ranging from between five and fifteen microseconds;

the substrate has a diameter of between approximately 5 and 13 centimeters and the coplanar waveguide is arranged on the substrate in a substantially random pattern;

the high-temperature superconductor comprises Yttrium-Barium-Copper Oxide to be cooled to approximately 77 degrees Kelvin, and the substrate comprises either Lanthanum-Aluminum Oxide or Magnesium Oxide; and

the oscillation frequency comprises a frequency between approximately 500 Mega-Hertz and six Giga-Hertz.

14. (Currently Amended) A receiver comprising:

a radio-frequency section to down-convert received RF signals using a low phase-noise reference signal; and

an oscillator to generate the low phase-noise reference signal at an oscillation frequency, the oscillator comprising a frequency generator to generate the reference signal responsive to a control signal, a delay element comprising a high-temperature superconductor to time-delay the reference signal and provide a low phase-noise time-delayed reference signal when cooled to a cryogenic temperature, a variable phase shifter to generate a phase-shifted reference signal, and a phase detector to generate the control signal from a phase difference between the time-delayed reference signal and the ~~a~~ phase-shifted reference signal, [[.]]

wherein during operation of the oscillator, the control signal is to cause the frequency generator to change the oscillation frequency to drive the phase difference between the low phase-noise time-delayed reference signal and the phase-shifted reference signal to substantially ninety degrees.

15. (Original) The receiver of claim 14 wherein the low phase-noise reference signal exhibits deviations of less than approximately 125 dBc/Hz at 10 KHz for a Ka-band oscillation frequency, and less than approximately 135 dBc/Hz at 10 KHz for an X-band oscillation frequency.

16. (Original) The receiver of claim 15 wherein the delay element comprises a coplanar waveguide comprising the high-temperature superconductor, the coplanar waveguide to operate as a delay line to provide the low phase-noise time delayed reference signal when cooled to within a cryogenic temperature range.

17. (Original) The receiver of claim 16 wherein the coplanar waveguide is arranged on a semiconductor substrate in a substantially random pattern to provide a time-delay of between 5 and 15 microseconds.

18. (Original) The receiver of claim 17 further comprising a cooling element to reduce the temperature of the delay element to within the cryogenic temperature range.

19. (Original) The receiver of claim 18 wherein the receiver is part of a radar system to detect low-Doppler radar signals.

20. (Currently Amended) A method of generating a low phase-noise reference signal comprising:

generating a reference signal at an oscillation frequency in response to a control signal;

phase-shifting the reference signal to generate a phase-shifted reference signal;

time delaying the reference signal with a delay element comprising a high-temperature superconductor cooled to within a cryogenic temperature range to generate a low phase-noise time-delayed reference signal; and

generating the control signal from a phase difference between the time-delayed reference signal and the ~~a~~ phase-shifted reference signal, [[.]]

wherein the control signal is to change the oscillation frequency to drive the phase difference between the low phase-noise time-delayed reference signal and the phase-shifted reference signal to substantially ninety degrees, and

wherein an amount of phase shift applied by the phase-shifting is selectable to set the oscillation frequency.

21. (Original) The method of claim 20 wherein time delaying comprises time delaying the reference signal through a coplanar waveguide comprising the high-temperature superconductor, the coplanar waveguide operating as a delay line to provide the low phase-noise time-delayed reference signal when cooled to within the cryogenic temperature range.

22. (Original) The method of claim 21 further comprising cryogenically cooling the delay element to generate the low phase-noise time-delayed reference signal.

23. (Original) The method of claim 21 further comprising:

phase shifting the reference signal to generate the phase-shifted reference signal to have approximately ninety-degree phase difference from the low phase-noise time-delayed reference signal;

low-pass filtering the control signal; and

controlling a frequency generator with the filtered control signal to generate the reference signal.